GUN CLEANING DEVICE AND METHOD

RELATED APPLICATION

This application claims the benefit of U.S. Provisional Application No. 60/276,962 filed March 19, 2001.

FIELD OF INVENTION

The invention is a device and a method for cleaning the bore of guns. The device cleans the bore as the weapon is fired and the device is propelled through the bore.

BACKGROUND OF THE INVENTION

Current methods for cleaning pistols, rifles, shotguns, revolvers and other weapons include the use of a patches, cloths, solvents, rods, and bore brushes. Such tools and accessories are usually found in variety of gun cleaning kits. A couple of typical cleaning kits are Kleen-Bore Gun Cleaning Kits and Hoppe's Bench Rest™ Premium Gun Cleaning Kits.

In a typical method for cleaning the bore includes soaking an adsorbent patch in a solvent, passing the soaked patch through the bore a number of times with a patch holder at the end of a rod, dipping a bore brush in the solvent and passing it through the bore several times and passing dry patches through the bore a sufficient number of times to assure all residue has been removed from the bore.

There is a need for a simple device and method that greatly simplifies the foregoing gun cleaning method.

SUMMARY OF THE INVENTION

The device of the present invention greatly simplifies the prior art method for bore cleaning. One embodiment of the bore-cleaning device comprises a primed cartridge case adapted to hold a bore cleaning means for cleaning the bore and to contain

a propellant for propelling the bore cleaning means through the bore. The bore cleaning means has a bore-cleaning member and a back end having a base for mounting a rear end of the bore cleaning member. The method of the present invention comprises feeding into a chamber of a gun the bore-cleaning device having the bore-cleaning member at its forward end and firing the gun causing the device to be propelled through the bore and thoroughly cleaning the bore.

BRIEF DESCRIPTION OF THE DRAWINGS

Further features and advantages will become apparent from the following and more particular description of the preferred embodiment of the invention, as illustrated in the accompanying drawing in which:

FIG. 1 is a top, rear and right side perspective view of one embodiment of the bore-cleaning device of the present invention;

FIG. 2 is a cross-sectional view of the bore-cleaning device of the present invention shown in FIG. 1 taken along line 2-2 of FIG. 1;

FIG. 3 is an exploded perspective top, rear and right side view of the embodiment of the bore-cleaning device of the present invention shown in FIGS. 1-2;

FIG. 4 is a top, rear and right side perspective view of another embodiment of the bore-cleaning device of the present invention;

FIG. 5 is a cross-sectional view of another embodiment of the bore-cleaning device of the present invention shown in FIG. 4 taken along line 5-5 of FIG. 4;

FIG. 6 is an exploded perspective top, rear and right side view of the embodiment of the bore-cleaning device of the present invention shown in FIGS. 4-5;

FIG. 7 is a top, rear and right side perspective view of still another embodiment of the bore-cleaning device of the present invention;

FIG. 8 is a cross-sectional view of the embodiment of the bore-cleaning device of the present invention shown in FIG. 7 taken along line 8-8 of FIG. 7; and

FIG. 9 is an exploded perspective top, rear and right side view of still another embodiment of the bore-cleaning device of the present invention shown in FIGS. 7-8.

DETAILED DESCRIPTION OF THE INVENTION

FIGS. 1-3 are illustrative of a typical configuration of bore-cleaning device 1 of the present invention. Bore-cleaning device 1 comprises primed cartridge 10 and a first bore-cleaning member in the form of metal brush 12 attached to the base 14 by fastener 16. Fastener 16 consists of threaded female shaft 18 projecting from back end 20 of base 14 and threaded end 22 of male shaft 24 from which the plurality of bristles 26 project.

In one embodiment of the present invention, a second bore cleaning member in the form of oil-saturated adsorbent 30 is shown in FIG. 3 mounted over the exterior of female shaft 18. Washer 34 encircles male shaft 24 adjacent rear 36 of brush 12 and provides a spacer between adsorbent 30 and base 14. Adsorbent 30 is secured to washer 34 by means of at least one tooth 38 and base 14 when threaded end 22 is tightened within threaded female shaft 18.

Base 14 comprises metal sleeve 40 having opening 42 in back end 20 for female shaft 18. Sleeve 40 serves as the primary building block of base 14 and holder for shaft 18 while sleeve 40 is filled with plug 46. One method of fabricating base 14 is to insert shaft 18 through opening 42 in front wall 48 so that head 50 of sleeve 40 abuts against wall 48 and the exterior of shaft makes snug contact with opening 42 as shown in FIG. 2. Molten metal, preferably lead, is then poured into sleeve 40 and allowed to cool forming plug 46 and to cause base 14 to become a unitary piece. Any imperfections on the exposed surface of plug 46 are removed. The latter fabrication step is not critical, since plug 46 does not come into contact with the weapon's rifling.

Alternative methods can be used to fabricate base 14 that are well known to those skilled in the art. For example, sleeve 40 can be heated and plug 14 can be cooled and

inserted into sleeve 40 to form a unitary piece after base 14 assumes room temperature. The exact amount and total weight of plug is varied according to the particular caliber of the weapon. Plug 46 is the primary variable to provide the necessary projectile weight and momentum for device 1.

Bore-cleaning device 1 is designed specifically for each type of gun or other weapon that is to be cleaned. The outside diameter of sleeve 40 matches the given caliber of each particular gun to be cleaned. This allows sleeve 40 to interact directly with the rifling of the particular gun bore to be cleaned. Sleeve 40 provides device 1 with the same rotation as the rifling of the barrel upon the firing of the gun. Sleeve 40 is pressed into opening 60 of cartridge 10 in the same manner as a ball projectile is pressed into a cartridge of a round of ammunition. Base 14 serves as a seal to hold the charged propellant 70 within primed cartridge 10 until primer 72 is stuck by the weapon's firing pin (not shown) to propel device 1 through the weapon's bore. Preferably, sleeve 40 consists of sub-tempered copper in accordance with the temper of the weapon. Base 14 also serves as a heat shield between the blast of the propellant and adsorbent 30 to prevent ignition of adsorbent 30. The exact amount of propellant will be selected by one have ordinary skill in at the art based on the particular weapon and the total weight of device 1 to be propelled.

Upon device 1 being propelled through the bore, brush 12 provides scouring contact with the bore's interior walls and rifling to loosen and remove the debris and residue that is left from previous fired rounds. The diameter of rear 36 of brush 12 is about 0.001 to 0.008 inch greater than the inside diameter of the barrel proving an aft flex to bristles 26 and a spring fit within the bore. As brush 12 is propelled through the barrel, the proper degree of scouring resistance is achieved between bristles 26 and the bore. Bristles 26 are of a predetermined temper and density to provide the desired degree of scouring resistance. The metal of bristles 26 is sub-tempered based on the temper of the barrel or rifling. The fine threads of treaded end 22 of male shaft 24 are opposite the direction of the rifling. This causes the threads to hold tight against the threads of female shaft 18 as brush 12 is propelled in a counter rotation through the barrel. Brush 12 is

designed to clean all surfaces in direct contact with a projectile including the loading ramp of an automatic cocking pistol (ACP). Because of the torque and velocity forces applied to the threads of female shaft 18, the integrity of the metal and the holding strength of the threads must exceed these applied forces. Preferable metals for female shaft 18 and male shaft 24 are titanium and alloys thereof.

Adsorbent 30 preferably consists of high density, oil-saturated cotton, wool, or a synthetic material, e.g., 3M® Scotch-Brite™ hand pads, generally formed in the shape of a doughnut. The diameter of its hole 43 equals the outside diameter of shaft 18. Adsorbent 30 is conical in shape with its small, inverted end 44 inserted first within cartridge 10 toward plug 46 as shown in FIG. 2. The diameter of the opposite large end of adsorbent 30 is slightly greater than the inside diameter of cartridge 10, i.e., substantially the same the diameter as that of rear 36 of brush 12. The large end of adsorbent 30 is compressed within cartridge 10 to provide a final cleaning action as it is propelled through the bore. On firing, adsorbent 30 rotates in conjunction with brush 12 to collect and extract debris from the barrel rifling that is left over from the cleaning action of brush 12. The centrifugal force of the rotation causes adsorbent 30 to expand as it is propelled through the bore. In addition, adsorbent 30 lubricates the interior of the bore of the weapon.

Female shaft 18 consists of titanium, engineering alloy or other hardened metals that are strong enough to withstand the applied torque. Shaft 18 is provided with a universal thread to accommodate a wide variety of applications to mate with threaded end 22 of male shaft 22. The threads of shaft 18 are reversed in accordance with the rifling of the bore of the particular application. The exact dimensions of shaft 18 are dependent on the caliber of the weapon.

FIGS. 4-6 show another embodiment of the present invention without brush 12. In this embodiment, oil-saturated adsorbent 80 is shown mounted to male shaft 82 by an epoxy or other known means to weld adsorbent 80 to metal male shaft 82. Spacer 90, consisting of leather, wool or similar non-metallic material, can be placed between

adsorbent 80 and base 14 to provide additional means for removing debris and residue from the bore. The only other major difference between the device shown in FIGS. 1-3 and FIGS. 4-6 is female shaft 94 for mating with threaded end 95 of male shaft 82. In this embodiment, end 96 of shaft 94 through opening 42 is flush with back end 20. After the lead has cooled during the fabrication of base 14, the notches in head 96 become filled in and shaft 94 is within base 14 as shown in phantom in FIG. 6.

FIGS. 7-9 show still another embodiment of the present invention without adsorbent 30. In this embodiment, brush 112 having rounded nose 124 and straight walls 125 to provide the necessary contact with the bore for maximum cleaning efficiency. Bristles 126 project from male shaft 128 in the same manner as in the embodiment of FIGS. 1-3 except they are shorter in length adjacent spacer 90. Threaded end 129 mates with female shaft 94 in the same manner as that of the device shown in FIGS. 4-6.

The three embodiments of the device of the present invention described above give rise to a number of possible methods of the present invention.

In one method of the present invention, device 1 shown in FIGS. 1-3 is fed into a chamber of a gun and fired to thoroughly cleaning the bore in one shot. In this method, device 1 can be included as the last round in a clip of ammunition. If the weapon is normally cleaned after every third clip, then the clip with device 1 will be that third clip.

In a second method of this invention, device 100 shown in FIGS. 4-6 is fed into a chamber of a gun and fired after a conventional bore-cleaning brush is used to clean the bore.

In a third method of this invention, device 130 shown in FIGS. 7-9 is fed into a chamber of a gun and fired and then the conventional steps of passing adsorbent patches through the bore to remove the residue left from use of devise 130 and lubricating the bore with proper lubricant.

In a fourth method, device 130 is fed into a chamber of a gun and fired followed by feeding and firing device 100. In this method, the next to last round of a clip of

ammunition includes device 100 and the last round includes device 130 to provide for the complete bore cleaning operation to take place.

The examples that follow illustrate the embodiments of this invention used in the cleaning of a .45 caliber revolver. The examples are for illustrative purposes only and are not meant to limit the scope of the claims in any way.

Example A

Brush 112 is made from bronze bristles 126 with the outside diameter being in the range of 0.451 to 0.458 inch or 0.001 to 0.008 inch greater than the barrel of a .45 caliber revolver. The length of brush 112 from rounded end 124 to the other end that is flush against leather spacer 90 is 0.3125 (5/16) inch. Spacer 90 has a diameter 0.45 inch and a thickness of 0.0625 (1/16) inch. The hole in spacer 90 is the same as the diameter of shaft 94. Shaft 94 has a length of 0.3125 (5/16) inch. Sleeve 40 has a diameter of 0.45 inch and a length of 0.3125 (5/16) inch. Device 130 is fabricated by first placing sleeve 40 in a jig (not shown). Threaded end 129 of titanium shaft 128 is joined to titanium female shaft 94 with spacer 90 between brush 112 and sleeve 40. Hot lead is then poured into copper sleeve 40 and allowed to cool. In the final step, base 14 is cooled and inserted into open end 60 of heated copper cartridge 10. Upon cooling, the resulting device 130 is test fired in a .45 caliber pistol.

Example B

Adsorbent 80 consists of high density 100% cotton saturated with a quality gun lubricant with the outside diameter being in the range of 0.451 to 0.458 inch or 0.001 to 0.008 inch greater than the barrel of a .45 caliber revolver. The length of adsorbent 80 is 0.3125 (5/16) inch. Adsorbent 80 is affixed to titanium male shaft 82 substantially as shown in FIG. 5. The other elements of device 100 are the same as those of device 130. The method of fabricating device 100 is the same as those steps described above in connection with device 130. The resulting device 100 is test fired after the .45 caliber revolver has been used to fire device 130 to result in a pistol ready for action.

Without departing from the spirit and scope of this invention, one of ordinary skill in the art can make various changes and modifications to the device and the method invention to adapt it to various usages and conditions. As such, these changes and modifications are properly, equitably, and intended to be, within the full range of equivalents of the following claims.